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REMARKS

The present Response and Amendment is intended to be fully responsive to all points of objection and/or rejection raised by the Examiner and is believed to place the application in condition for allowance. Applicants assert that the present invention is new, non-obvious and useful. Favorable reconsideration and allowance of the application is respectfully requested.

Status of Claims

Claims 21-46 are pending in this application. Claims 1-20 have been canceled without prejudice or disclaimer in a previous amendment.

Claims 33, 38 and 46 have been amended to more clearly define embodiments of the invention.

No new matter has been added.

In view of the following, further and favorable consideration is respectfully requested.

Claim Rejections

On pages 2 and 3 of the Official Action claims 21, 23, 31-35 and 44-46, have been rejected under 35 USC §102 as being anticipated by Grimes II et al. in US Patent 4,705,949.

On page 4 of the Official Action, claim 22 has been rejected under 35 USC §103 as being obvious in view of Grimes II et al. in US Patent 4,705,949.

The anticipation and obviousness rejections are respectfully traversed.

The Examiner asserts that Grimes II et al. in US Patent 4,705,949 teaches a specimen enclosure assembly having an aperture and defining an enclosed specimen placement volume and an electron beam permeable, fluid impermeable, cover sealing said specimen placement volume at said aperture, and a pressure controller maintaining said enclosed specimen placement volume at a pressure which exceeds a vapor pressure of a sample in said specimen placement volume and is greater than a pressure of a volume outside said specimen enclosure assembly, wherein a pressure differential across said cover does not exceed a threshold level at which rupture of said cover would occur, as presently claimed.

Anticipation under 35 USC § 102 requires that a single prior art reference teach each and every limitation of the claimed invention and enable one skilled in the art to make the

anticipating subject matter. MPEP §2131. The identical invention must be shown in as complete detail as is contained in the claim. Richardson v. Suzuki Motor Co., 9 USPQ2d 1913, 1920 (Fed. Cir. 1989); MPEP §2131.

Present claim 21 recites, inter alia:

a specimen enclosure dish having an aperture and defining an enclosed specimen placement volume;

an electron beam permeable, fluid impermeable, cover sealing said specimen placement volume at said aperture from a volume outside said specimen enclosure assembly; and

a pressure controller communicating with said enclosed specimen placement volume, said pressure controller being configured for maintaining said enclosed specimen placement volume at a pressure which exceeds a vapor pressure of a sample in said specimen placement volume and is greater than a pressure of a volume outside said specimen enclosure assembly, wherein a pressure differential across said cover does not exceed a threshold level at which rupture of said cover would occur.,

Present claim 34 recites, inter alia:

providing a specimen enclosure dish having an aperture and defining an enclosed specimen placement volume;

attaching an election beam permeable, fluid impermeable, cover to said specimen placement volume at said aperture for sealing said aperture from a volume outside said specimen enclosure assembly; and

providing a pressure controller communicating with said enclosed specimen placement volume, said pressure controller being configured for maintaining said enclosed specimen placement volume at a pressure, which exceeds a vapor pressure of a sample in said specimen placement volume and is greater than a pressure of a volume outside said specimen enclosure assembly, wherein a pressure differential across said cover does not exceed a threshold level at which rupture of said cover would occur.

Grimes II et al. disclose a specimen cell comprising a cavity in the specimen cell operative to mount an open or closed specimen module which is scanned by an electron beam through a small

aperture. During preparation of the electron microscope for observation, the aperture is closed by a door so as to prevent evaporation of liquids from the specimen. The door is mechanically or electronically opened to facilitate observation thus minimizing the exposure of the specimen to the desiccation and/or destructive vacuum effects. The aperture is sized so as to provide a resistance to vapor flow through the aperture while permitting bidirectional electron flow facilitating the electron microscopic observation of the specimen.

Hence, the apparatus disclosed by Grimes II et al. is constructed to allow penetration of an electron beam to a specimen via an exposed, unsealed aperture. The aperture is closed by a door only when imaging by an electron beam is not being performed. The specimen is placed in close proximity to the aperture to reduce the vapor thickness, which the electron beam is to penetrate so as to reach the specimen. This is described by Grimes II et al. on column 3, lines 55-63: "A closed specimen module 10 is located within the cell 8 and has a small aperture 12 located therein. The aperture comprises a means for bidirectionally passing electrons into and out of the closed specimen module 10 and for restricting passage of vapor out of the inner portion of the specimen module. Such a means in a preferred embodiment comprises an aperture approximately 200 microns in diameter." and on column 4, lines 58-64: "In order to obtain the best scanning resolution, it is desirable that the chamber volume be relatively large but the distance from the aperture 12 to the specimen be minimized. This is to reduce, to the extent possible, the vapor thickness through which the electron beam must penetrate before reaching the specimen surface." It is well understood by persons skilled in the art that exposure of an unsealed specimen to the vacuum environment outside the specimen module will cause at least the layer exposed to the vacuum environment to be dehydrated to a substantial degree. Dehydration of the specimen layer exposed to the vacuum will alter the native, natural state of the specimen. Additionally, since the penetration depth of an electron beam of a scanning electron microscope is limited (typically a number of microns in biological samples), a large portion of reflected electrons are obtained from the layer exposed to the vacuum and thus the resulting image largely comprises the substantially dehydrated, unnatural state of the specimen.

In contrast to Grimes II et al., the aperture of claims 21 and 34 is sealed from the vacuum environment outside the specimen enclosure assembly by an electron beam permeable, fluid

impermeable, cover. Imaging of the specimen may be performed for example by an electron beam permeating the specimen via the cover.

Grimes lacks a seal over the aperture as required by independent claims 21 and 34.

In claims 21 and 34 a pressure controller is provided and is configured for maintaining the environment within the specimen enclosure assembly at a pressure, which exceeds a vapor pressure of a sample in the specimen enclosure assembly and is greater than a pressure of a volume outside the specimen enclosure assembly. See e.g., the present specification in paragraph 6 of the published application: "a specimen enclosure assembly for use in an electron microscope and including a rigid specimen enclosure dish having an aperture and defining an enclosed specimen placement volume, an electron beam permeable, fluid impermeable, cover sealing the specimen placement volume at the aperture from a volume outside the enclosure and a pressure controller communicating with the enclosed specimen placement volume and being operative to maintain the enclosed specimen placement volume at a pressure which exceeds a vapor pressure of a liquid sample in the specimen placement volume and is greater than a pressure of a volume outside the enclosure". Therefore, unlike in Grimes II, in some embodiments of the present invention, an image obtained from a specimen placed in the enclosure assembly of the present invention will be an unaltered image of the native, natural state of the specimen.

The aperture comprised in the Grimes II et al. specimen cell must be sized to be of small dimensions so as to prevent evaporation of fluid from within the specimen cell, as described on column 3, line 64 – column 4 , line 8: "The aperture must be small enough to slow the escape of vapor to the point where the pressure within the module is maintained higher than the vapor pressure of the volatile constituent of the sample while at the same time allowing the electron beam to reach the solid surface of the specimen in the module and then allow sufficient number of electrons to escape and reach the detector which is external to the specimen module. There appears to be a range of from 200 angstroms to 500 microns which will operate satisfactorily although a different diameter aperture may be desirable depending upon the thickness and geometric configuration of the aperture." It is well understood by a person skilled in the art that the required small diameter of the aperture minimizes the field of view i.e. the area of the specimen impinged by the electron beam for imaging the specimen. In the preferred embodiment

described by Grimes II et al. an aperture of a diameter of 200 microns is disclosed. In some embodiments of the present invention, in contrast, the aperture of the specimen enclosure assembly of the present invention may not be so limited in size and may be configured according to the dimensions of the specimen. Some embodiments of the present invention allow for the diameter of the aperture to be in the range of a number of millimeters, although the invention is not limited to such dimensions.

As discussed, claims 21 and 34 are allowable, as the cited prior art lacks all elements of these claims. Each of claims 21-33 and 35-46 depend from, and include at least all the limitations of, one of independent claims 21 and 34, and thus are likewise allowable.

Thus, Applicants request that the Examiner withdraw the rejection of claims 21, 23, 31-35 and 44-46 under 35 USC §102 as being anticipated by Grimes II, and the rejection of claim 22 under 35 USC §103 as being obvious in view of Grimes II.

Claim Objections

The Examiner objected to claims 24-30 and 36-43. The Examiner did not reject these claims, and thus Applicants assume that these claims include allowable subject matter. Clarification is requested. Further, Applicants assert that, as discussed, these claims are allowable as being dependent on allowable base claims.

CONCLUSION

In view of the foregoing, Applicants submit that the application is in condition for allowance. Early notice to that effect is earnestly solicited. The Examiner is invited to contact the undersigned attorney if it is believed that such contact will expedite the prosecution of the application.

No fees are believed to be due in connection with this paper. However, if any fees are due, please charge such fees to deposit account No. 50-3355.

Respectfully submitted,

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